

Figure 1a: Composite analyses relative to active periods of the ISO during the Boreal summer in the Indian ocean. Fields are OLR relative to the scale. Diagram shows that negative (positive) anomalies over the Indian Ocean are associated with positive (negative) anomalies in the Tropical Americas as can be seen at Day -15 and -10 (0 and 5).

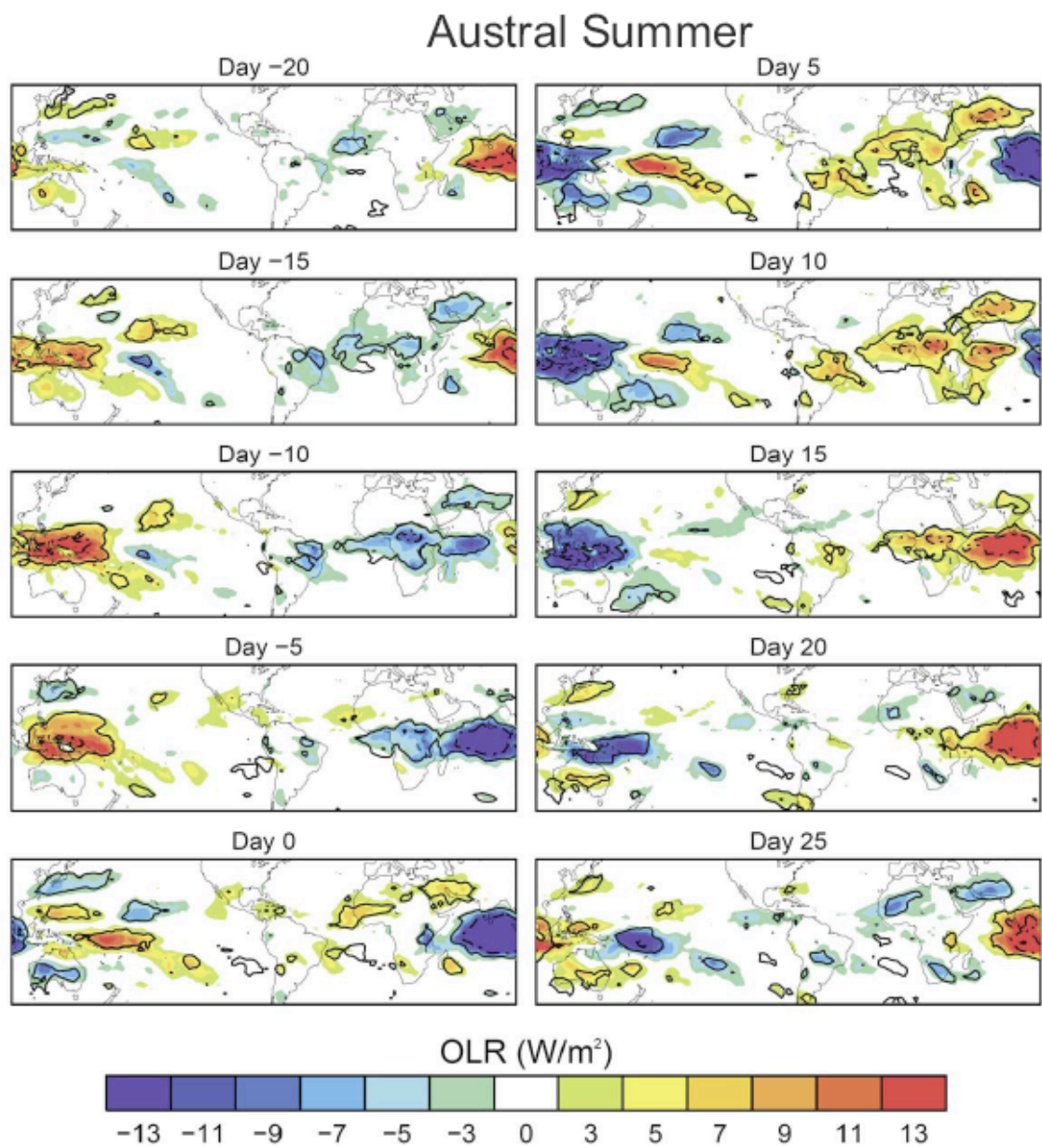


Figure 1b: Same as Figure 1a except for the austral summer.

## COMPOSITES BASED ON SOUTH-EAST BRAZIL INTRASEASONAL EVENTS

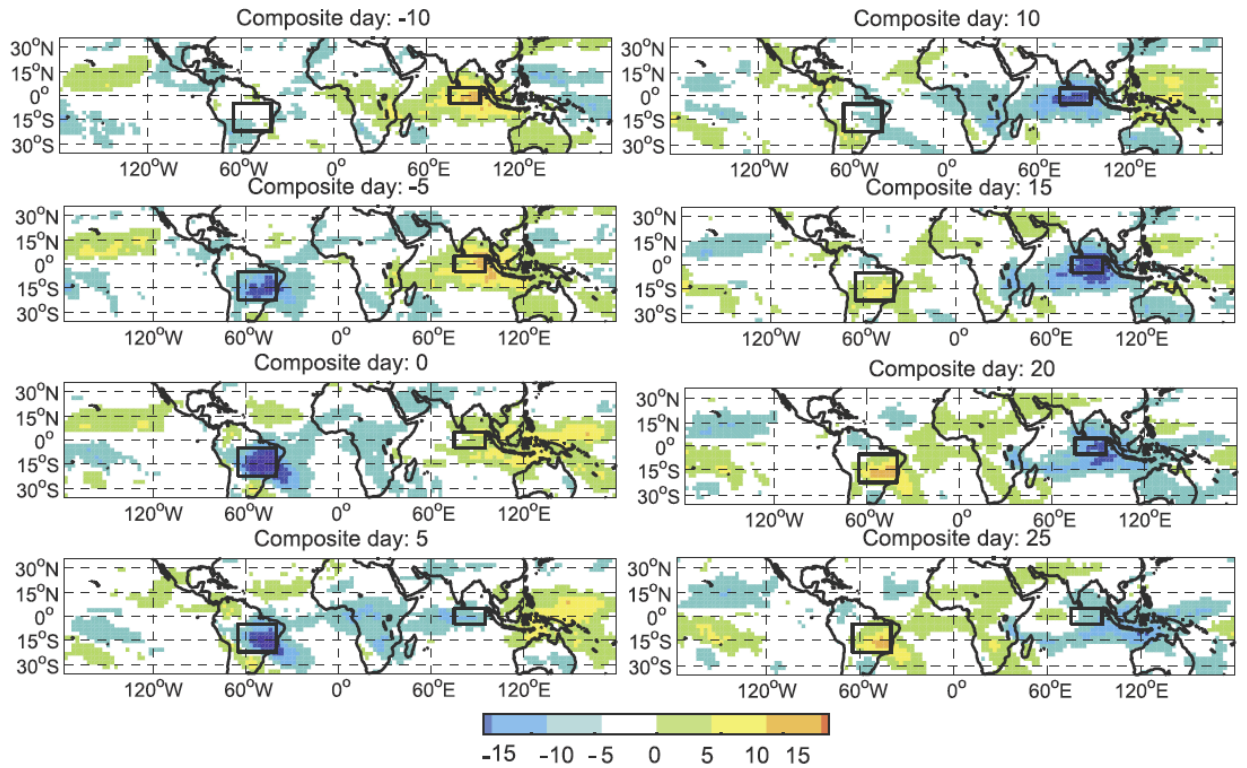


Figure 2: OLR composites intraseasonal peak events over South-East Brazil confirming the link between the observed intraseasonal activity in the Indo-West Pacific basin and South America during both boreal and austral summers.

# Phase-Space Diagrams

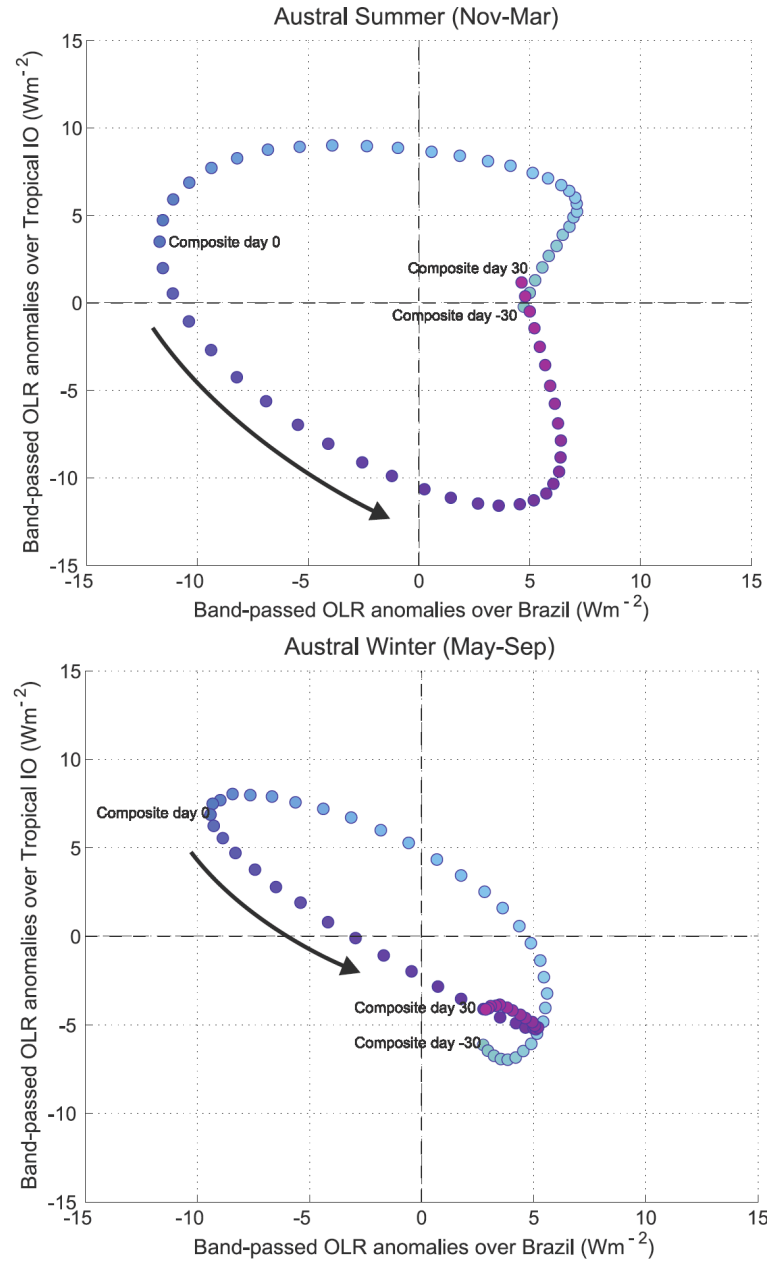


Figure 3: Phase-space diagrams of the composite OLR anomaly over Brazil (independent variable) and over the Equatorial Indian Ocean (dependent variable) based on the cases selected for Brazil. These “strings of pearls” summarize the almost out-of-phase relationship between the intraseasonal activity in both regions, showing an negatively tilted ellipse-like shape especially during the Austral winter.



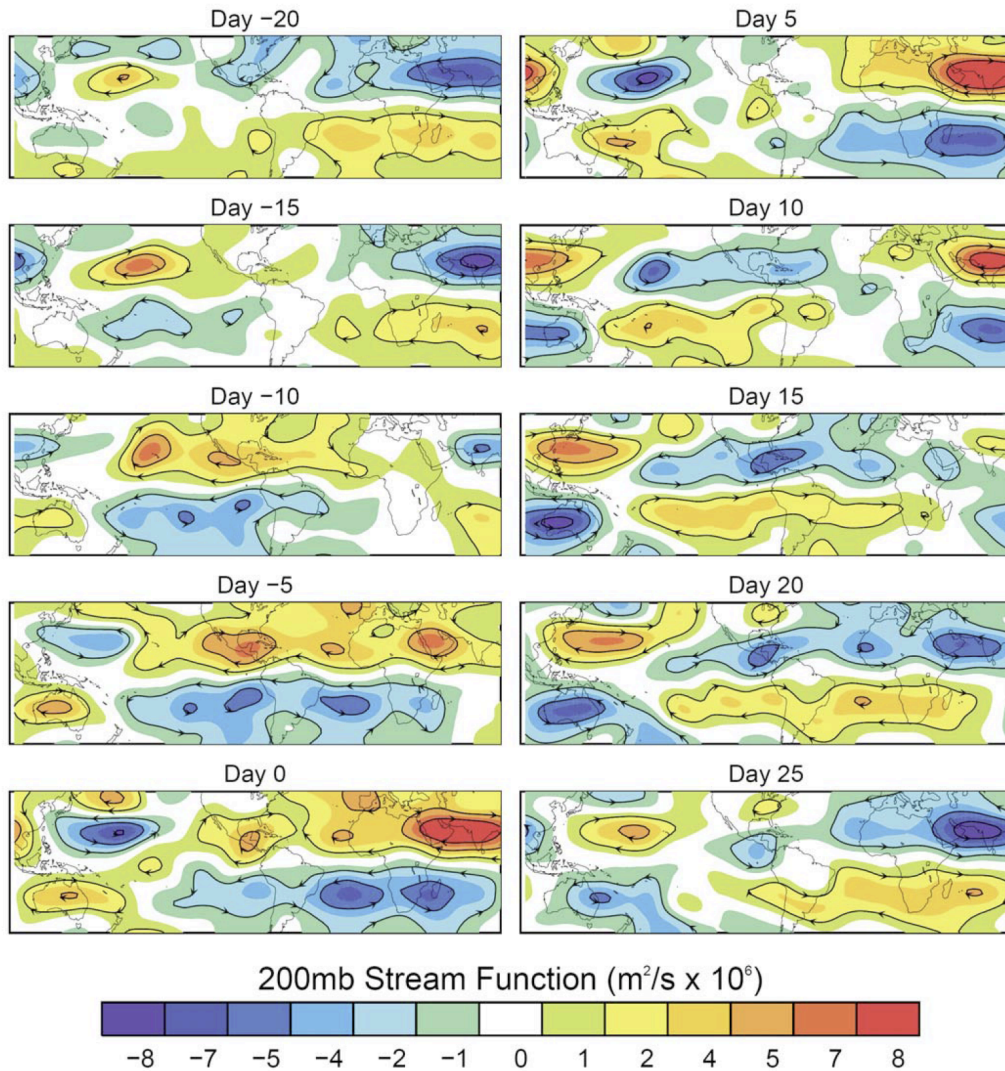
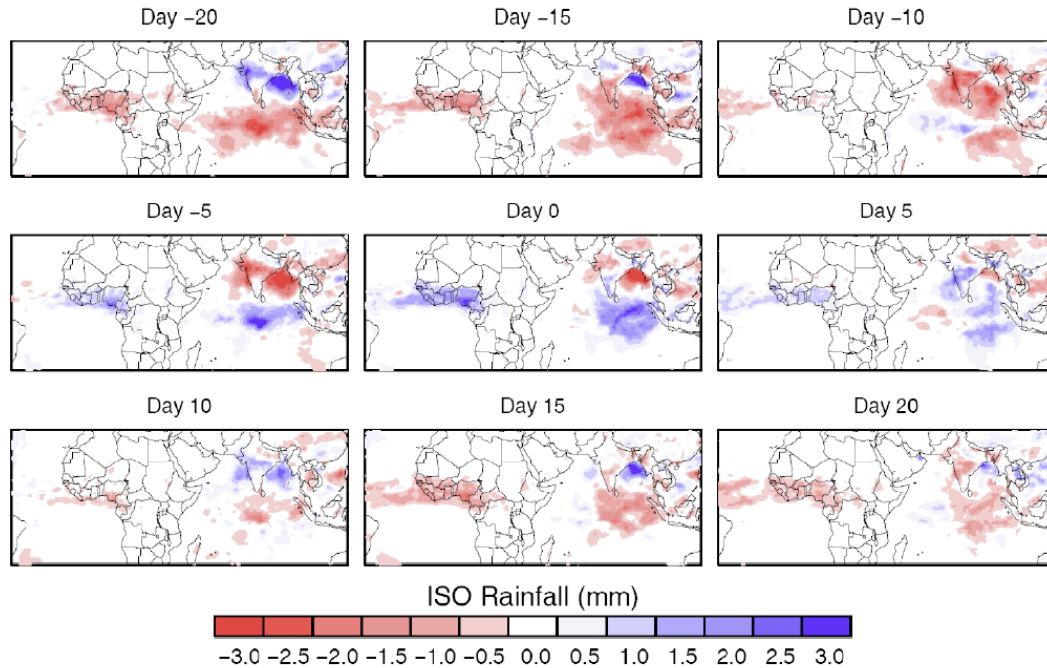


Figure 4: Composites of stream function suggesting a possible mechanism linking Indo-Pacific and Americas ISO is through modulation of the Tropical Easterly Jet. Figure 4 shows two strong off-equatorial anticyclones, associated with positive geopotential height intraseasonal anomalies, appearing to the west of the convective anomalies in the Indo-Pacific warm pool, accompanied by two weaker cyclones and their corresponding negative geopotential height anomalies to the east of the convection. The cyclones/anticyclones located to the east of the convective anomaly reach the Americas potentially modulating local variability. The stream function anomalies over the Americas appear to reach their maximum amplitude when the convective anomalies are also at their peak.

## West Africa – Indian Ocean Basin Connection



## Composites of Intraseasonal Rainfall Anomalies Based on West Africa Active Events

Figure 5: The apparent association between West Africa ISO and Indian Ocean ISO appears as another consequence of the same mechanism linking Americas and Indian Ocean ISO, also suggesting a possible modulation through the African Easterly Jet. The figure shows that, over Africa, the anomalies associated to the oscillation appear over a narrow band along the Gulf of Guinea coast also extending into the ocean. This oscillation, that modulates the magnitude of the rainfall associated to the African Easterly Waves, appears to grow and vanish over the same location, with no apparent propagation. The composite structure shows and in-phase relationship between active phases over West Africa and Equatorial Indian Ocean, and the corresponding out-of-phase association between West Africa and Bay of Bengal and India. In other words, the full structure of the Monsoon Intraseasonal Oscillation is recovered when compositing based on West African events.

## EOF\_VP200\_10 DAY

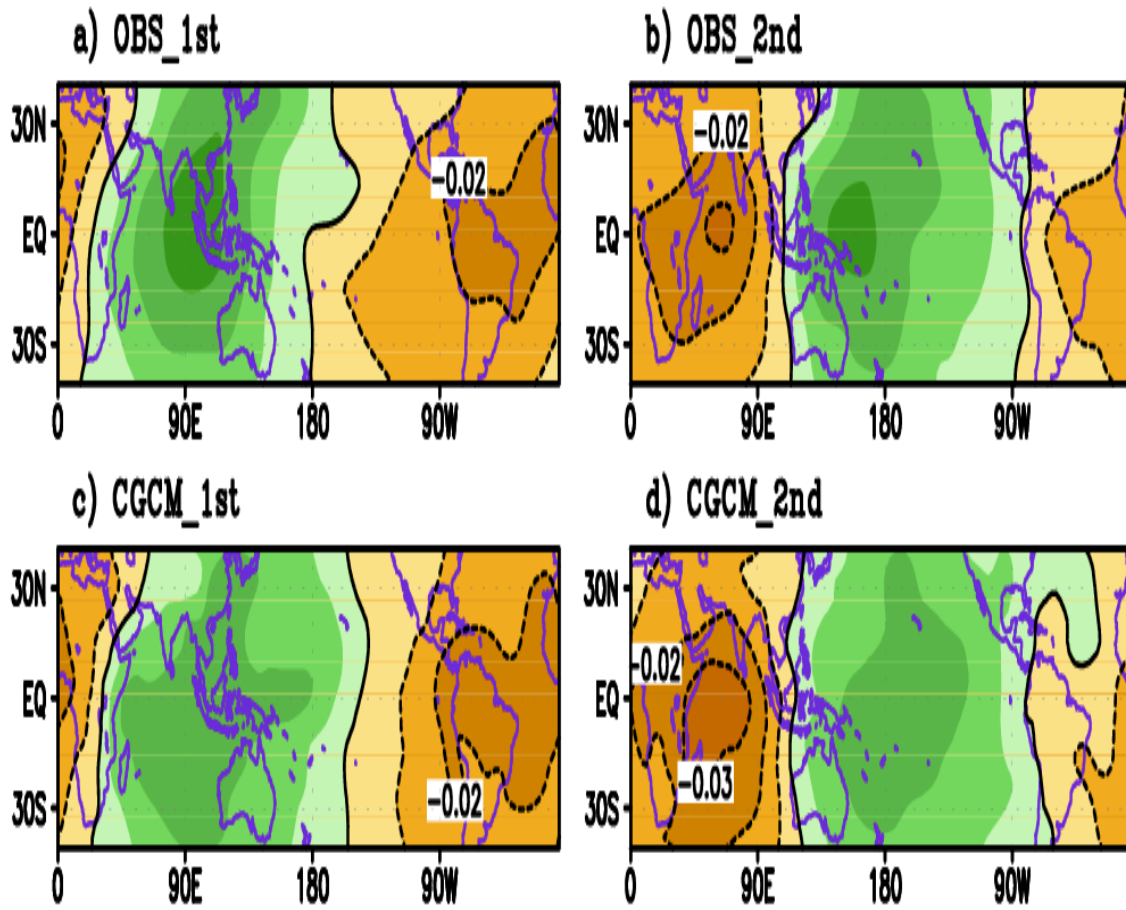


Figure 6: The first (left) and second (right ) EOFs of intraseasonal oscillations of a 10-day forecast compared to observed composites. Fields are velocity potential.

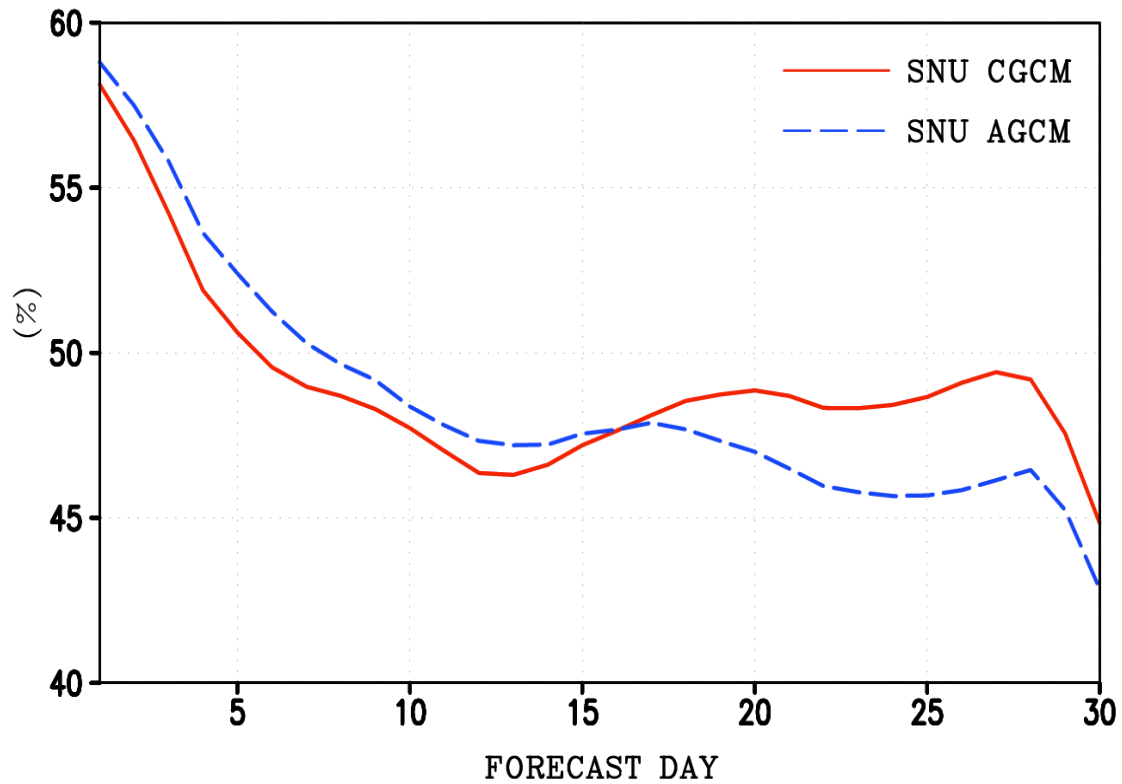


Figure 7: Percentage of filtered variance accounted by the first two EOFs of filtered VP200 as a function of forecast lead time for the CGCM (solid) and AGCM (dashed). The observed value is 64.3%. Note the substantial increase of variance explained by the coupled model compared to the atmospheric model in which observed SST was prescribed.